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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
LUGO, DAVID B

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/800,268	POLLMANN ET AL.	
	Examiner	Art Unit	
	David B. Lugo	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26,28-85,90-93,95 and 96* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26,28-71,78-84,95 and 96* is/are allowed.

6)☒ Claim(s) *72-77,85,90 and 91* is/are rejected.

7)☒ Claim(s) *92 and 93* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *03 October 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This Office action, in response to Applicant's amendment filed on 7/22/02, is a final Office action.

Response to Arguments

2. Applicant's arguments filed 10/3/02 have been fully considered. Applicant's arguments with respect to claims 73, 85 and 91 are not persuasive.

3. Regarding claim 73, Applicant argues that the prior art of record fails to teach that the gain of the equalizer is determined based on an equalizer tap value. Chevillat et al. U.S. Patent 4,775,988 teaches that the gain is computed based on the samples in the equalizer. Since the samples in the equalizer are inherently affected by the equalizer tap values, the gain computation is broadly considered to be based on those values.

4. Regarding claim 85, Applicant argues that the prior art of record fails to teach a two part preamble. In particular, Applicant states that claim 85 distinguishes from the art of record in view of the arguments presented with respect to claim 78. Claim 78 describes a preamble having a first part modulated using a lower order technique and a second part modulated using a higher order technique than the modulation technique used for the first part, whereby the Applicant states that the art of record fails to disclose such a two-part preamble that uses both low order and high order modulation techniques. However, claim 85 only recites a two part preamble and does not recite two distinct modulation techniques. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Kamerman, U.S. Patent 4,849,996 discloses that, after an initial training sequence, subsequent transmissions commence with

a two segment training segment, as disclosed in column 4 lines 55-68, broadly considered to be a two-part preamble.

5. Regarding claim 91, Applicant argues that the prior art of record fails to teach that the correlation between the input and the output of an equalizer is based on equalizer tap values. Tsujimoto, U.S. Patent 6,075,808 discloses a correlation between the input and the output of an equalizer, and since the output of the equalizer is inherently affected by the equalizer tap values, the correlation is broadly considered to be based on those values.

6. Regarding claim 74, Applicant has not addressed the rejection set forth in the previous Office action, but has added the limitation of "associating a more robust modulation scheme with the remote site" if the noise value exceeds a threshold value. This added limitation is addressed in the rejection below.

7. Regarding claims 72, 76 and 90, the added limitations are addressed in the rejections stated below.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Acampora et al. U.S. Patent 4,232,197, Rafie et al. U.S. Patent Application 2002/0126748 and Goldstein et al. U.S. Patent 6,002,713.

Kamerman teaches a modem system where data bursts from a plurality of remote sites are demodulated using stored channel parameters for each remote site, and equalizer coefficients associated with a received burst are stored and retrieved in a receiver parameter storage.

Kamerman does not expressly disclose a control module configured to determine the expected sequence of bursts from a plurality of remote sites and the generation of feedback and feedforward equalizer tap values for storage in the parameter memory module, whereby the feedforward equalizer taps are generated based on an a previous burst from the remote site.

Acampora teaches processing circuitry for detecting markers indicating the sequence of bursts from a number of remote sites.

It would have been obvious to one of ordinary skill in the art to use processing circuitry as taught by Acampora in the modem system of Kamerman so data received from a plurality of remote locations can be accurately determined and processed.

Rafie discloses an adaptive burst modem system where the equalizer taps for a received burst are generated in accordance with a previously received burst, as disclosed on page 5 paragraphs 56-58.

It would have been obvious to one of ordinary skill in the art to use the tap storage method of Rafie in the system of Kamerman to shorten the time needed to train the equalizer.

Goldstein discloses a decision feedback equalizer comprising feedback and feedforward tap coefficients.

It would have been obvious to use a decision feedback equalizer in the system of Kamerman/Rafie where the coefficients of the feedback and feedforward equalizers are stored in a parameter memory for use in a subsequent burst in accordance with the tap storage method of Rafie, because DFE's are well known to be effective in severe cases of distortion, as stated by Goldstein in column 3 lines 50-55.

Regarding the limitations of a first and second temporary buffer, one of ordinary skill in the art would recognize that in order to store or retrieve information to or from a memory location, temporary buffers are necessary so data is not overwritten in the transfer process.

10. Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Murakami U.S. Patent 4,575,857 and Chevillat et al. U.S. Patent 4,775,988.

Kamerman teaches a modem system where data bursts from a plurality of remote sites are demodulated using stored channel parameters for each remote site where equalizer coefficients associated with a received burst are retrieved, but does not expressly disclose that the gain of the equalizer is determined based on an equalizer tap value and is applied to an equalizer coefficient.

Chevillat teaches gain computation means connected to the equalizer 27, where the gain is computed based on the samples in the equalizer. Since the samples in the equalizer are inherently affected by the equalizer tap values, the gain computation is broadly considered to be based on the equalizer tap values.

Murakami shows in Fig. 2 an automatic equalizer having controllable tap gains and a tap correcting means for successively correcting the tap gains of the transversal filter.

It would have been obvious to one or ordinary skill in the art to use the automatic gain control method taught by Chevillat and the equalizer with controllable tap gains as taught by Murakami in the modem system of Kamerman '989 so no portion of the signal is lost due to rapid gain changes as stated by Chevillat in column 3 lines 7-20 and so linear distortion may be removed as stated by Murakami (see abstract).

11. Claims 74 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Zuranski et al. U.S. Patent 6,263,077.

Regarding claim 74, Kamerman teaches a modem system where data bursts from a plurality of remote sites are demodulated using stored channel parameters for each remote site and equalizer coefficients associated with a received burst are retrieved and stored in a receiver parameter storage, but does not expressly disclose the determination of noise and error values for validating or invalidating the parameter.

Zuranski teaches a digital subscriber line communication system having an error processor 96 as shown in Fig. 4 comprising a Reed-Solomon decoder 120 and a mean-squared error calculator 122 that provides an indication of the signal-to-noise ratio (see column 13 lines 6-17). Zuranski further teaches that when error processor 96 determines that a particular number of errors are occurring or that the noise exceeds a certain threshold, the current parameters are no longer valid and rapid retrain circuit 94 is invoked. Further Zuranski states that if the fast retrain operation fails, then a fast-retrain

reduce-rate operation is performed, where the data rate reduction is considered to correspond with a more robust modulation scheme.

It would have been obvious to one of ordinary skill in the art to use the error and noise indicators as taught by Zuranski in the modem system of Kamerman to maintain high speed and accurate communication in the presence of communication line impairments.

Regarding claim 75, it would have been obvious to one of ordinary skill in the art to implement the method in a Time Division Duplex system so bi-directional communication may be established.

12. Claims 76 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Acampora et al. U.S. Patent 4,232,197, Rafie et al. U.S. Patent Application 2002/0126748 and Zuranski et al. U.S. Patent 6,263,077.

Regarding claim 76, Kamerman teaches a modem system where data bursts from a plurality of remote sites are demodulated using stored channel parameters for each remote site and equalizer coefficients associated with a received burst are retrieved and stored in a receiver parameter storage, but does not expressly disclose a control module configured to determine the expected sequence of bursts from a plurality of remote sites and the determination of noise and error values for validating or invalidating the parameter, whereby equalizer taps are generated based on a previous burst from the remote site.

Acampora teaches processing circuitry for detecting markers indicating the sequence of bursts from a number of remote sites.

It would have been obvious to one of ordinary skill in the art to use processing circuitry as taught by Acampora in the modem system of Kamerman so the order of the received data can be accurately determined and processed.

Rafie discloses an adaptive burst modem system where the equalizer taps for a received burst are generated in accordance with a previously received burst, as disclosed on page 5 paragraphs 56-58.

It would have been obvious to one of ordinary skill in the art to use the tap storage method of Rafie in the system of Kamerman to shorten the time needed to train the equalizer.

Zuranski teaches a digital subscriber line communication system having an error processor 96 as shown in Fig. 4 comprising a Reed-Solomon decoder 120 and a mean-squared error calculator 122 that provides an indication of the signal-to-noise ratio (see column 13 lines 6-17). Zuranski further teaches that error processor 96 determines whether a particular number of errors occur or whether noise exceeds a certain threshold.

It would have been obvious to one of ordinary skill in the art to use the error and noise indicators as taught by Zuranski in the modem system of Kamerman to maintain high speed and accurate communication in the presence of communication line impairments.

Regarding claim 77, it would have been obvious to one of ordinary skill in the art to implement the method in a Time Division Duplex system so bi-directional communication may be established.

13. Claim 85 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,996 in view of Goldstein et al. U.S. Patent 6,002,713.

Kamerman discloses a modem system that demodulates data from a plurality of remote sites using stored channel parameters, but does not expressly disclose a feed forward tap update module configured to generate equalizer tap values based on an initial gain and equalizer error and an adaptive filter in communication with the feed forward tap update module.

Goldstein discloses a feed forward tap update module 131 that generates tap values used by feed forward equalizer 132 using gain coefficients (1+g) and equalizer error (e_g) determined from a training signal to correct for distortion and interference.

It would have been obvious to one or ordinary skill in the art to use an equalizer arrangement as taught by Goldstein in the system of Kamerman so the modem function properly in the presence of interference.

14. Claim 90 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Rafie et al. U.S. Patent Application 2002/0126748 and Zuranski et al. U.S. Patent 6,263,077.

Kamerman teaches a modem system where data bursts from a plurality of remote sites are demodulated using stored channel parameters for each remote site and equalizer coefficients associated with a received burst are retrieved, but does not expressly disclose a Reed Solomon decoder and a signal to noise ratio calculator for determining channel characteristics used in the determination of an adaptation factor for use with incoming data, where the demodulated burst was demodulated with channel characteristics and metrics from a previous burst from the remote site.

Rafie et al. discloses an adaptive burst modem system where a received burst is demodulated according to the channel characteristics of a previously received burst, as disclosed on page 5 paragraphs 56-58.

It would have been obvious to one of ordinary skill in the art to use the method of Rafie et al. in the system of Kamerman to shorten the time needed to demodulate the incoming burst.

Zuranski teaches a digital subscriber line communication system having an error processor 96 as shown in Fig. 4 comprising a Reed-Solomon decoder 120 and a mean-squared error calculator 122 that provides an indication of the signal-to-noise ratio (see column 13 lines 6-17). The error conditions indicated by the Reed-Solomon decoder and the mean-squared error calculator are used by the modem to adapt the communication parameters for data reception, as described in column 11 line 60 to column 12 line 4.

It would have been obvious to one of ordinary skill in the art to use the error and noise indicators as taught by Zuranski in the modem system of Kamerman to maintain high speed and accurate communication in the presence of communication line impairments.

15. Claim 91 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamerman U.S. Patent 4,849,989 in view of Tsujimoto U.S. Patent 6,075,808.

Kamerman discloses a modem system that demodulates data from a plurality of remote sites using stored channel parameters, but does not expressly disclose correlating the input and output of an equalizer, determining an angle of correction based on the correlation, and shifting the incoming burst by applying the angle of correction to the incoming burst.

Tsujimoto discloses a circuit where correlators 319 and 320 are used to correlate the input and output of an adaptive equalizer 321 to adjust the input to the equalizer (see Fig. 4). Since the output of the equalizer is inherently affected by the equalizer tap values, the correlation is broadly considered to be based on the equalizer tap values.

It would have been obvious to one of ordinary skill in the art to use the teaching of Tsujimoto in the modem system of Kamerman for cancellation of ISI as stated by Tsujimoto in column 6 lines 48-54.

Allowable Subject Matter

16. Claims 26, 28-71, 78-84, 95 and 96 are allowed.

17. Claims 92 and 93 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **David B. Lugo** whose telephone number is **(703) 305-0954**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Stephen Chin**, can be reached at **(703) 305-4714**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

David B. Lugo
Patent Examiner

12/13/02

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600